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| 09/772,532 | 01/28/2001 | Yasuumi Ichimura | | 9214 |

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EXAMINER

EDWARDS, PATRICK L

| ART UNIT | PAPER NUMBER |
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2621

DATE MAILED: 05/19/2004

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/772,532

Applicant(s)

ICHIMURA, YASUUMI

Examiner

Patrick L Edwards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03/26/2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-10 is/are rejected.
- 7) ☒ Claim(s) 4-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. The claim amendments and substitute specification received on March 26, 2004 (paper numbers 4 and 5, respectively) have been placed in the file and were considered by the examiner. An action on the merits follows.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on February 1, 2000. It is noted, however, that applicant has not filed a certified copy of the Japanese application as required by 35 U.S.C. 119(b).

Applicant's Amendments

3. The applicant's specification as originally filed was objected to under 35 USC 112 in the previous action as being non-compliant with the requirement that a specification be written in "full, clear, concise, and exact terms".

The applicant has replaced the originally filed specification with a substitute specification in order to resolve the prior objection. The applicant has enclosed both a clean version and a marked-up version of the substitute specification.

The examiner is persuaded that the substitute specification is in compliance with the requirements of 35 USC 112 and hereby withdraws the original objection to the specification.

4. The applicant's claims (1-3) as originally filed were rejected in the previous action under 35 USC 103 as being unpatentable over Throup (USPN 6,292,167) in view of Aoyama (USPN 6,480,300).

The applicant has cancelled the originally filed claims 1-3 and added new claims 4-10. It stands that the arguments with respect to the originally filed claims are now rendered moot in view of the new set of claims. The new claims have been fully considered by the examiner and an action on the merits of these claims follows.

Claim Objections

5. The follow quotations of 37 CFR § 1.75(a) and (d)(1) provide the basis of objection:

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

(d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (See § 1.58(a)).

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6. Claims 4-10 are objected to under 37 CFR § 1.75(a) and (d)(1) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery, and failing to conform to the invention as set forth in the remainder of the specification.

With regard to claim 4, the phrase 'allocating said light data to pixels surrounded by an aperture', is indistinct and unclear in view of the specification. The specification refers to the process of spreading light into the shape of an aperture (paragraph [0008]) and then later describes this process by reciting that light data is spread 'over surrounding pixels according to the shape of a given aperture' (paragraph [0014]). The specification further describes this process with reference to Figure 3 in paragraph [0019] where it is stated that 'the amount of light is spread to surrounding pixels'.

The specification makes no mention of allocating light data to pixels. In fact, the only instances in which any form of the word 'allocate' are used in the specification are in specific reference to the allocation of memory (i.e. paragraph [0022]).

Additionally, the specification makes no mention of 'pixels surrounded by an aperture' as recited in the claim. Paragraph [0019] of the specification clearly explains that the value of a pixel is 'spread to the surrounding pixels within the area whose shape is determined from a shape of a given aperture'. The language used in this explanation is much clearer and considerably less awkward than the language recited in the claim.

With regard to claims 7-10, all of these claims contain similar unclear language and it follows that the above arguments with respect to claim 4 also apply to claims 7-10.

Claims 5 and 6 depend on claim 4 and are consequently objected to for the above reasons.

For examination purposes, the phrase 'allocating said light data to pixels surrounded by an aperture which has a predetermined shape' (or any similar modification of this phrase) will be interpreted to mean that the light data of a pixel is spread to its surrounding pixels, and the area with which it is spread is determined from the shape of an aperture.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 9 and 10 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. As currently written, these claims recite purely functional descriptive material, which is non-statutory per se. This problem could be easily remedied by amending the preamble of the claims to recite "A computer program, stored on a computer readable medium, comprising:"

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Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Throup (USPN 6,292,167) in view of Aoyama (USPN 6,480,300).

With regard to claim 4, Throup discloses a method of creating a defocused image from an input image (Throup col. 8 lines 29-31).

Throup discloses the claimed step (a) of receiving an input image including a plurality of pixel data (Throup col. 8 lines 32-33 with Figure 3).

Throup further discloses the claimed step (b) of selecting a pixel from the image (Throup col. 8 lines 41-43).

Throup further discloses the claimed step (d) of spreading the pixel data to its surrounding pixels (Throup col. 8 lines 41-45). Throup discloses that the area that the pixel data is spread is determined from the shape of an aperture (Throup col. 8 lines 61-64). Throup also discloses that spreading the pixel data over this area creates a defocused disk image in which all the pixels values of the disk are substantially equal to each other, and the total intensity of the disk is equal to the original pixel data which was spread (Throup col. 8 lines 48-53 with Figure 5). Throup discloses that the coefficients have values between 0 and 1, and the sum of the coefficients is 1. It follows that the coefficients that make up the array shown in Figure 5 of Throup (which is analogous to the claimed aperture determined area of pixels recited in the claim) are all equal to each other. In this particular example, the coefficients are equal to 1/25 (0.04). It follows that the sum of pixel value P_{22} multiplied with all of the array coefficients is indeed equal to the pixel value itself.

Throup further discloses repeating steps (b) and (d) for all pixel data included in the input image to create a defocused image (Throup col. 8 lines 45-48).

With regard to the claimed step (c) of converting the selected pixel data from a predetermined scale to a linear scale to generate light data, Throup discloses a gamma factor defining the relationship between the pixel data and the corresponding light data, but fails to expressly disclose a logarithmic conversion between these two scales.

Aoyama, however, discloses the conversion of the logarithmic digital data of the original image to a linear scale of data in order to generate light data having some light amount (Aoyama col. 3 lines 10-20), before performing a defocusing processing (Aoyama col. 3 lines 46-52).

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It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Throup's defocusing method by inserting the step of converting logarithmic pixel data to a linear scale before defocusing as taught by Aoyama. Such a modification would have allowed for the defocusing method of Throup to be performed on linear luminance data rather than logarithmic pixel data. This would have made for an electronic defocusing system that could more accurately represent the defocusing of an actual camera (Aoyama col. 3 lines 29-39).

With regard to claim 9, a computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in the combination of Throup and Aoyama is to function. Therefore, a computer-readable recording medium is inherent in these teachings.

With regard to claim 5, Aoyama further discloses converting the scale of the image back to the predetermined logarithmic scale after defocusing processing (Aoyama col. 3 lines 53-55).

With regard to claim 6, the combination of Throup and Aoyama discloses receiving an input image and converting the image into a linear scale before processing the image. The combination further discloses that this input data can be in a number of different formats (Throup col. 6 lines 39-47). In view of the aforesaid combination, it would have been obvious to one reasonably skilled in the art at the time of the invention to check the input image in order to see if it that image data format was already represented in a linear scale before performing a linear scale conversion process on the image. Such a modification would have allowed for a system that avoided redundancy conversions and provided for a more efficient image defocusing method.

11. Claims 7, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Throup and Aoyama as applied to claim 4 above, and further in view of Potmesil et al. ("A Lens and Aperture Camera Model for Synthetic Image Generation"). The arguments as to the relevance of Throup and Aoyama as applied above are incorporated herein.

With regard to claim 7, the aforesaid combination fails to expressly disclose the further limitation of determining the size of the defocused disk image based upon the pixel distance information. Potmesil, however, teaches determining the size of a defocused disk on the basis of pixel distance information (Potmesil pg. 299 right column with reference to Figure 5). The circle of confusion disclosed in Potmesil is analogous to the defocused disk recited in the claim. It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Throup and Aoyama's image defocusing method by determining the size of a defocused disk on the basis of pixel distance information as taught by Potmesil. Such a modification would have allowed for a system in which the amount of defocusing was proportion to the pixel distance information and consequently would have made for a system which generated more realistic looking images (Potmesil pg. 297 right column 1st paragraph).

With regard to claim 8, all of the limitations of the claim have been addressed in the above argument with respect to claim 7.

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With regard to claim 10, a computer-readable recording medium that stores a program which causes the computer to execute the steps of a method is essential if the image processing method disclosed in the combination of Throup, Aoyama and Potmesil is to function. Therefore, a computer-readable recording medium is inherent in these teachings.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.


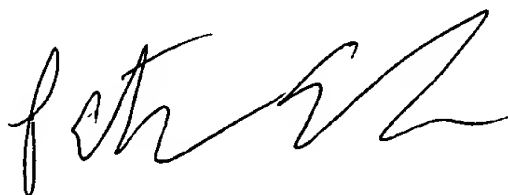
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Lynn Edwards

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BRIAN WERNER
PRIMARY EXAMINER